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# THE MERCK INDEX

AN ENCYCLOPEDIA OF  
CHEMICALS, DRUGS, AND BIOLOGICALS

THIRTEENTH EDITION

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## Stannous Iodide

8864

8852. Stannic Chloride. [7646-78-8] Tin tetrachloride; fuming spirit of Libavius.  $\text{Cl}_4\text{Sn}$ ; mol wt 260.52. Cl 54.43%, 45.57%.  $\text{SnCl}_4$ . Improperly called "tin bichloride".

Fuming, caustic liquid. d 2.26; mp  $-33^\circ$ ; bp  $114^\circ$ . Sol in ether and evolution of much heat; sol in alcohol, carbon tetrachloride, benzene, toluene, acetone, kerosene, gasoline. Keep tightly closed.

Pentahydrate. White or slightly yellow crystals or fused lumps; slight HCl odor. Very sol in  $\text{H}_2\text{O}$ ; sol in alc.

Caution: May be highly irritating to eyes, mucous membranes.

USE: As mordant; reviving colors; stabilizer for colors and dyes in soap; in dyeing of fabrics, weighting silk, tinning metals; dehydrating agent in organic syntheses; in ceramics to produce abrasion-resistant or light-reflecting coatings.

8853. Stannic Chromate(VI). [38455-77-5]  $\text{Cr}_2\text{O}_3\text{Sn}$ ; mol wt 350.69. Cr 29.65%, O 36.50%, Sn 33.85%.  $\text{Sn}(\text{CrO}_4)_2$ . Brownish-yellow, cryst powder; dec when heated. Sol in water.

USE: Decorating porcelain and china in rose and violet colors.

8854. Stannic Fluoride. [7783-62-2] Tin tetrafluoride.  $\text{SnF}_4$ ; mol wt 194.70. F 39.03%, Sn 60.97%.  $\text{SnF}_4$ . Lewis acid. Prep from  $\text{SnCl}_4$  and HF: Ruff, *Plato, Ber.* 37, 673 (1904); or from stannous fluoride and chlorine or bromine: Forbes, *Angew. J. Am. Chem. Soc.* 67, 1911 (1945); from stannous oxide and fluorine: Haendler et al., *J. Am. Chem. Soc.* 76, 179 (1954). Review: Kemmitt, Sharp, *Advan. Fluorine Chem.* 183-186 (1965).

Snow-white, tetragonal crystals. Very hygroscopic.  $d_4^{20}$  4.78. Melts at  $705^\circ$ . Hydrolyzes readily, but is more resistant to water than stannic chloride. Forms complexes with donor molecules.

USE: Friedel-Crafts catalyst.

8855. Stannic Iodide. [7790-47-8] Tin tetraiodide.  $\text{I}_4\text{Sn}$ ; mol wt 626.33. I 81.05%, Sn 18.95%.  $\text{SnI}_4$ . Toxicity data: *J. Pharm. Exp. Ther.* 43, 515 (1931).

Yellow to reddish crystals. d 4.46. mp  $\sim 143^\circ$ ; sublimes at  $180^\circ$ . bp  $340^\circ$ . Dec by water; sol in alcohol, benzene, carbon tetrachloride, ether, carbon disulfide. MLD in rats (mg/kg): 200 (Solmer).

8856. Stannic Oxide. [18282-10-5] White tin oxide; tin dioxide; stannic anhydride; flowers of tin.  $\text{O}_2\text{Sn}$ ; mol wt 150.71. Sn 78.77%, O 21.23%.  $\text{SnO}_2$ . Occurs in nature as the mineral cassiterite. The commercial grade is also known as polishing powder, putty powder, or tin ash.

White or slightly gray powder. d 6.95. Insol in water, alcohol, and dil acids. Slowly sol in hot concd potassium or sodium hydroxide soln.

Caution: Potential symptoms of overexposure are stannosis (or pneumoconiosis); dyspnea, decreased pulmonary function. See NIOSH Pocket Guide to Chemical Hazards (DHHS/NIOSH 97-140, 1997) p 308.

USE: Polishing glass and metals; manuf milk-colored, ruby enamel glass, enamels, pottery, putty; mordant in printing and dyeing fabrics; in fingernail polishes.

8857. Stannic Selenide. [20770-09-6] Tin diselenide.  $\text{Se}_2\text{Sn}$ ; mol wt 276.63. Se 57.09%, Sn 42.91%.  $\text{SnSe}_2$ . Prep by heating the vapor of selenium over heated tin: Little, *On Selenium and Some of the Metallic Selenides*, Göttingen (Thesis, 1892). By treating a soln of stannic chloride with hydrogen selenide: Zetzelius, cited in Mellor's vol. X, 785 (1930); by treating with an alkali selenostannate or sulfoselenostannate with hydrochloric acid: Dittie, *Compt. Rend.* 95, 641 (1882).

Black crystals. d 5.133 (Little); d 4.85 [Schneider, *Pogg.* 42, 624 (1866)]. mp  $650^\circ$ . Soluble in alkali, concd sulfuric acid, aqua regia, aq ammonia. Insol in water, dilute acids. Forms potassium selenostannate with potassium hydroxide; sodium selenostannate with sodium selenide.

8858. Stannic Sulfide. [1315-01-1] Tin disulfide; mosaic bronze.  $\text{S}_2\text{Sn}$ ; mol wt 182.84. S 35.07%, Sn 64.93%.

Golden leaflets with metallic luster; fatty feel to the touch. d 4.5. Insol in water or dil acids. Sol in aqua regia, in solns of alkali hydroxides or sulfides.

Note: The term "mosaic gold" is also used to designate an alloy consisting of 65.3% copper and 34.7% zinc.

USE: Gilding and bronzing metals, gypsum, wood and paper, usually by suspending in lacquer or varnish.

8859. Stannous Acetate. [638-39-1]  $\text{C}_2\text{H}_3\text{O}_2\text{Sn}$ ; mol wt 236.80. C 20.29%, H 2.55%, O 27.03%, Sn 50.13%.  $\text{Sn}(\text{C}_2\text{H}_3\text{O}_2)_2$ . Prep by refluxing granulated tin with 98% acetic acid; *Colonia, Gazz. Chim. Ital.* 35 II, 224 (1905); by refluxing  $\text{SnO}$  with 50% (v/v) acetic acid under nitrogen: Donaldson et al., *J. Chem. Soc.* 1964, 5942.

White, orthorhombic crystals; dec by water. mp  $182.5-183^\circ$ . d 2.31. Sol in dil HCl. Keep well closed.

USE: Reducing agent.

8860. Stannous Bromide. [10031-24-0] Tin dibromide.  $\text{Br}_2\text{Sn}$ ; mol wt 278.52. Br 57.38%, Sn 42.62%.  $\text{SnBr}_2$ .

Yellowish powder; oxidizes in air. d 5.12; mp  $215^\circ$ ; bp  $623^\circ$ . Sol in little water, gradually dec by much water; sol in alcohol, ether, acetone. Keep tightly closed and protected from light.

8861. Stannous Chloride. [7772-99-8] Tin dichloride; tin protochloride; Stannochlor.  $\text{Cl}_2\text{Sn}$ ; mol wt 189.62. Cl 37.39%, Sn 62.60%.  $\text{SnCl}_2$ . Prep: Stéphen, *J. Chem. Soc.* 1930, 2786; Williams, *Org. Syn. coll. vol. III*, 627 (1955). Metabolism and toxicity studies: M. Martiniak, *Acta Physiol. Pol.* 32, 193 (1981); P. P. Singh, A. Y. Jannarkar, *Ind. J. Pharmacol.* 23, 153 (1991).

Orthorhombic cryst mass or flakes; fatty appearance. bp  $247^\circ$ ; d 3.95. Sol in water, ethanol, acetone, ether, methyl acetate, methyl ethyl ketone, isobutyl alcohol. Practically insol in mineral spirits, petr naphtha, xylene. LD<sub>50</sub> in mice, rats (mg/kg): 1710.0, 2000.0 orally; 271.0, 316.0 i.p.; 34.8, 43.0 i.v. (Singh, Jannarkar).

Dihydrate. [10025-69-1]  $\text{Cl}_2\text{Sn} \cdot 2\text{H}_2\text{O}$ . Crystals; absorbs oxygen from air and forms insol oxychloride. d 2.71. mp  $37-38^\circ$  when rapidly heated; dec on strong heating. Sol in less than its own wt of water; with much water it forms an insol basic salt; very sol in dil or in concd hydrochloric acid; also sol in alcohol, ethyl acetate, glacial acetic acid, sodium hydroxide soln. Keep tightly closed, in a cool place.

USE: Powerful reducing agent, particularly in manuf of dyes and  $^{99m}\text{Tc}$  radiopharmaceuticals; in tinning by galvanic methods; in liquor finishing of wire; in sensitizing of glass and plastics before metallizing; as soldering flux; as mordant in dyeing with cochineal; in manufacture of tin chemicals, color pigments, pharmaceuticals, sensitized paper, lubricating oil additives; as tanning agent; in removing ink stains; in yeast revivers; as reagent in analytical chemistry; as catalyst in organic reactions.

8862. Stannous Fluoride. [7783-47-3] Tin difluoride; Fluoristan.  $\text{F}_2\text{Sn}$ ; mol wt 156.71. F 24.25%, Sn 75.75%.  $\text{SnF}_2$ . Prep by evaporating a soln of stannous oxide in hydrofluoric acid in the absence of oxygen: Gay-Lussac, Thénard, *Mém. Phys. Chim.* 2, 317 (1809); Nebergall et al., *J. Am. Chem. Soc.* 74, 1604 (1952); from tin and hydrogen fluoride: Muetterties, *Inorg. Chem.* 1, 342 (1962). Review: Kemmitt, Sharp, *Advan. Fluorine Chem.* 4, 186 (1965).

Monoclinic, lamellar plates. mp  $213^\circ$ . d<sub>4</sub> 4.57. Sol in water (about 30%). Forms an oxyfluoride,  $\text{SnOF}_2$ , on exposure to air.

USE: Dental caries prophylactic.

8863. Stannous Hexafluoroarsenate(IV). [12419-43-1] Stannous fluoroarsenate(IV).  $\text{F}_6\text{SnZr}$ ; mol wt 323.92. F 35.19%, Sn 36.65%, Zr 28.16%.  $\text{SnZrF}_6$ . Prep from  $\text{ZrF}_4$  and  $\text{SnF}_2$ : Muhler, US 3266996 (1966 to Indiana University Foundation). Crystals. d 4.21. Sol in water.

USE: In anticaries preparations.

8864. Stannous Iodide. [10294-70-9] Tin diiodide.  $\text{I}_2\text{Sn}$ ; mol wt 372.52. I 68.13%, Sn 31.87%.  $\text{SnI}_2$ . Preparation and crystal structure: Moser, Trevena, *Chem. Commun.* 1969, 25. Red, cryst powder or needles. d 5.28; mp  $320^\circ$ ; bp  $720^\circ$  with decomp. Slightly sol in and dec by water; sol in solns of alkali